How DP Bio Works at RISS

Cell Structure (Topic A2.2)

Theme/Concept	Level of Organization			
	1. Molecules	Cells	Organism	Ecosystems
Unity and Diversity		A2.2 Cell Structure		

Essential Idea(s): Cells are the smallest functional unit of living organisms, and come with a wide range of shapes, sizes, and functionalities.

Guiding Questions: What are the features common to all cells and the features that differ?

How is microscopy used to investigate cell structure?

Unit Length: 3 lessons (+2 AHL lessons)

Materials:

- ❑ Self-Teaching Slides (SL) / Self-Teaching Slides (AHL)
- ❑ Quizlet Vocab Set (SL and HL)

This is a unit plan. You work your way through about 55 of these in HL and for SL.

You should start and end every week's work with these unit plans.

This tells us where we are in the IB "Road Map" for DP Bio (see next slide).

Theme/Concept	Level of Organization			
	1. Molecules	Cells	Organism	Ecosystems
Unity and Diversity		A2.2 Cell Structure		

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Unit Length: 5 lessons (+2 AHL lessons)

Materials:

❑ Self-Teaching Slides (SL) / Self-Teaching Slides (AHL) ❑ Teaching Slides (SL) / Teaching Slides (AHL)	❑ Quizlet Vocab Set (SL and HL) ❑ Notes Template (SL) / Notes Template (AHL)

Outline:

IB Statement(s) and Objective(s)	**Activities:** Ⓟ = podcast / ? = inquiry 5 / Ⓦ = Write it / Æ = The academy / ⓡ = Read it & respond **Remember to select an activity that aligns with your chosen skill track for this term*
A2.2.1: Cells as the basic structural unit of all living organisms • State the three parts of the cell theory • NOS Concept: Deductive reason can be used to generate predictions from theories A2.2.2: Microscopy skills • Define micrograph • Label the parts of a light microscope • Demonstrate how to focus the microscope on a sample • Define magnification	Æ: **Virtual Tour Guide Through Cells** ( ) Screencast a recording of the following interactive 3D models: bacterial cell / plant cell / animal cell. Take us on a virtual tour of each, highlighting the key features of both prokaryotic and eukaryotic cells (and their organelles), then comparing/ contrasting the features of each. Include as much from this unit as possible (e.g. the characteristics of living things). Ⓛ: **The Dirtiest Things at This School** (max 2) Look around you - what surface is home the most bacteria? Design an experiment to test this out (watch this for inspiration).

Theme	Level of organization			
	1. Molecules	2. Cells	3. Organisms	4. Ecosystems
A **Unity and diversity**	Common ancestry has given living organisms many shared features while evolution has resulted in the rich biodiversity of life on Earth.			
	A1.1 Water **A1.2** Nucleic acids	**A2.1** Origins of cells *[HL only]* **A2.2** Cell structure **A2.3** Viruses *[HL only]*	**A3.1** Diversity of organisms **A3.2** Classification and cladistics *[HL only]*	**A4.1** Evolution and speciation **A4.2** Conservation of biodiversity
B	Adaptations are forms that correspond to function. These adaptations persist from generation to generation because they increase the chances of survival.			
	B1.1 Carbohydrates and lipids	**B2.1** Membranes and membrane transport	**B3.1** Gas exchange **B3.2** Transport	**B4.1** Adaptation to environment

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- ❏ Self-Teaching Slides (SL) / Self-Teaching Slides (AHL)
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- ❏ Quiz
- ❏ Note

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Self-Teaching Slides

Feel free to use this like a textbook. It is simply a single collated collection of all the slides from the unit.

There are separate slides for Standard Level (SL*) and Additional Higher Level (AHL).

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Teaching Slides

This is what I pull up in class. These slides have less detail and text than the Self-Teaching slides.

I am also working to enhance these with discussion questions, interactive quizzes, etc.

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Quizlet sets are simply vocabulary sets for extra practice.

Vocab is a key part of biology - so go here to study the key terms from each week.

You should always spend a bit of time on each of these!

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…nvestigate cell structure?

…(AHL)	❑ Quizlet Vocab Set (SL and HL) ❑ Notes Template (SL) / Notes Template (AHL)

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Ⓛ: **The Dirtiest Things at This School** (max 2)

Look around you - what surface is home the most bacteria? Design an experiment to test this out (watch this for inspiration).

Notes Templates

(from IBBioSone)

If you need extra guidance with your note-taking, these are templates specific to each week's topics. Use them as you learn how to take good notes.

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Guiding Questions: What

How is

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Materials:

- ❑ Self-Teaching Slides (
- ❑ Teaching Slides (SL) /

The Key Objectives from IB.

Each bullet point is <u>what you must be able to do</u> as an IB Bio student.

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Within each slide, the blue headings always match the bullet point from the key objectives.

Slides for that specific sub-topic

(Use these to see if you can answer each bullet point.)

State the three parts of the cell theory

The ABC's of the cell theory:

- **A**ll living things are composed of cells
- **B**asic Unit -- The cell is the basic unit of all life
- **C**ells only come from preexisting cells

Water (Topic A1.1)

Theme/Concept	Level of Organization			
	1. Molecules	Cells	Organism	Ecosystems
Unity and Diversity	A1.1 Water			

Essential Idea(s): Water is the medium of life

Guiding Questions: What physical and chemical properti
What are the challenges and opportu

Unit Length: 3 lessons (+2 AHL)

Materials:

A key for each type of activity you can choose for that week.

A list of all your activity options for the week's topic.

Activities: Ⓟ = podcast / 🅸 = inquiry 5 / Ⓦ = Write it /
Æ = The academy / Ⓛ = lab task / Ⓡ = Read it

(Required) Ⓟ/Ⓦ/Æ/🅸 - Lab!: The Water Labs (👨‍🔬 / 👫 max 2)
Have a look at these various mini-labs that explore the various properties of water. Choose a few to actually set up and carry out yourself (most are quite simple to set up / break down). Record or write the answers to the questions that go along with your chosen mini-labs.

Æ: Water (👨‍🔬)
Record a Khan Academy-style video explaining the properties of water covered in Topic A1.1 (go here for inspiration). Make sure you explain how these properties make water so essential for life.

A1.1.2: Hydrogen bonds as a consequence of the polar covalent bonds within water molecules

- Write the molecular formula for water and draw the atomic structure of the molecule
- Describe the cause and effect of the polar nature of water
- Describe hydrogen bonds

Water (Topic A1.1)

Essential Idea(s): Water is the medium of life

Theme/Concept	Level of Organization			
	1. Molecules	Cells	Organism	Ecosystems
Unity and Diversity	A1.1 Water			

roperties of water make it essential for life?

opportunities of water as a habitat?

- ❑ Quizlet Vocab Set (SL)
- ❑ Quizlet Vocab Set (HL)

Sometimes, you'll see an activity **in red**.

That is a required activity -- everyone must complete these.

Activities: Ⓟ = podcast / ? = inquiry 5 / Ⓦ = Write it / Æ = The academy / Ⓛ = lab task / Ⓡ = Read it

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- Outline the evidence that life originated in water

A1.1.2: Hydrogen bonds as a consequence of the polar covalent bonds within water molecules

- Write the molecular formula for water and draw the atomic structure of the molecule
- Describe the cause and effect of the polar nature of water
- Describe hydrogen bonds

Grading, Weekly Lessons, & Skill Tracks

3 HL + SL bio lessons per week (≈135 min)

45 min:

- New content is presented. Take notes and ask questions!
- Kognity time - should be completed *each week* *(will often be HW)*

30 min: **FLEX Time** (Quiz/Q&A/Other)

- Can be one of several things: Quiz (≈1 every 2 weeks), more activity time, Q & A time, peer feedback time, test review, etc.

60 min: Activity time!

- Work on activities!**

How will I be graded?

2 Summative Grades per term

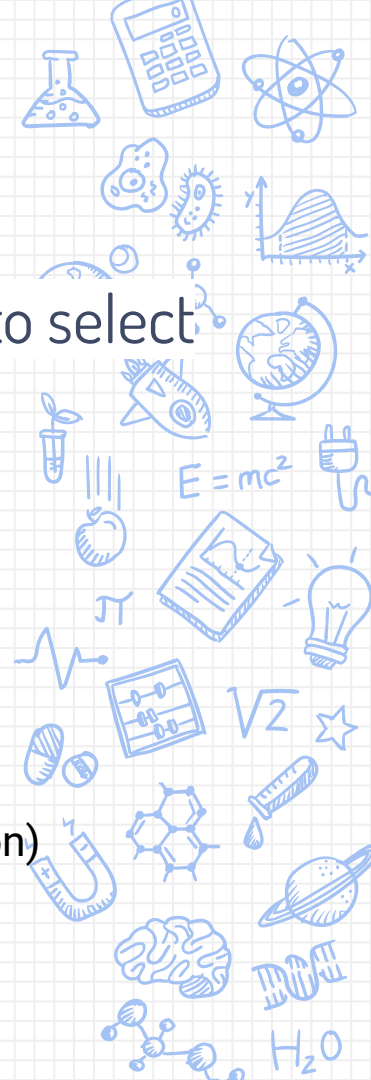
One cumulative content exam (70%)

One project (30%)

This is typically a lab report, written report, or some other similar project.

Skill Tracks

- When doing activities, you are strong recommended to select ***one skill track per term*** from the following options:
  - ⓟ = Podcast (verbal communication skills)
  - ⓦ = Write it (written communication skills)
  - Æ = The academy (teaching tasks: combines planning + presentation + communication skills)
  - ⍰ = Inquiry (The skill of effective questioning for further exploration)
- Each skills track has a unique (but similar) rubric. Click the links above to see each rubric.

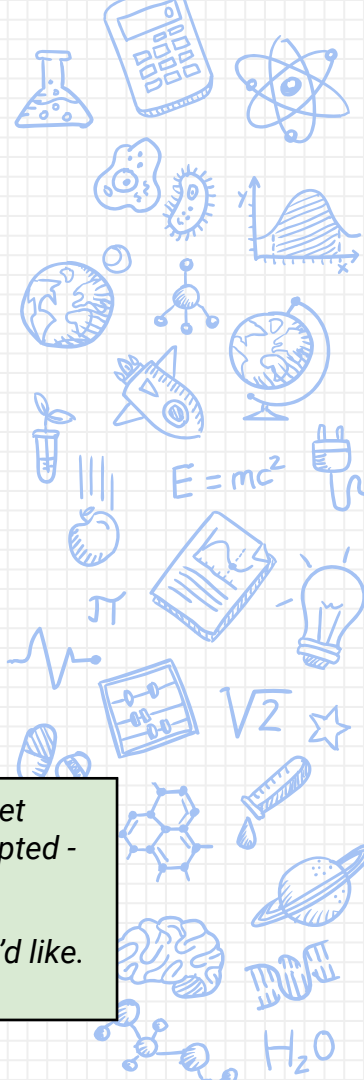


Skill Tracks

- The goal for completing activities within the same skill track is to **improve at that skill for that term**.
- Feedback will be given for submissions – sometimes via G. Classroom, sometimes verbally. More feedback is always available upon request – just ask me!

*All activities should be completed during **activity blocks** - these are 45-60-minute periods that will be set aside for you to complete your work in class. Activity work completed outside of class will not be accepted - you must start and finish your writing in the activity block.*

You may prepare resources ahead of time for these blocks and use them while writing as much as you'd like.



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